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Introduction

This Installation Guide provides software deployment instructions for caXchange. This document will be used as a recommendation and guideline by the deployment team for installation and configuration of the software.

caXchange is a service oriented, robust and configurable infrastructure for exchanging information among various applications and systems. caXchange is defined as the set of software components that is primarily responsible for receiving input from various external systems, routing the received input to various services, and eventually routing the output of those services to external systems.

Introduction 1

Components

caXchange v1.0 is comprised of the following components:

- caXchange Hub The JBI compliant Apache Servicemix ESB on which various routing and transformation services and components will be deployed.
- caXchange Database The MySQL database instance is used by caXchange to store and retrieve various pieces of information.
- caGrid Inbound Grid Service This acts as a proxy to caXchange hub and makes it available on caGrid.

Other NCICB application dependency that this solution has include:

- Common Logging Module (CLM) Logging in caXchange is provided using Common Logging Module. Logs can be viewed using Log Locator Tool (LLT).
- Credential Delegation Service

Minimal System Requirements for caXchange

The system requirements for caXchange vary for the main components so they are listed here by component.

• Unix: Red Hat Linux, Fedora 4 and 5, Mac OS X, 1 G RAM

• Windows: Windows XP, Windows 2003, 1G RAM

caXchange has been tested on the platform(s) shown in.

Linux Server	Windows
HP Proliant DL380G4	Compaq Presario V6000
1 x Intel® Xeon? 3.4 GHz	Intel Core Duo 2.0 GHz
1 GB	2 GB
System 1 x 25GB	System 1 x 100GB
Red Hat Linux EL 3.0 (kernel 2.6.9-55.0.9)	Windows XP Professional Version 2002 Service Pack 2

Software and Technology Requirements for caXchange

Components 2

Required Software not included in caXchange

You must download and install the required software that is not included with caXchange (listed in Table 2). The software name, version, description, and URL hyperlinks (for download) are indicated in the table.

Software Name	Version	Higher Version Allowed	Description	URL
Java Run Time Edition (JRE)	1.5_10	Yes	Java Runtime environment for caXchange	http://java.sun.com/
MySQL Database	4.1.24	Yes	caXchange database platform used by caXchange for storage and retrieval of data. Servicemix is also configured to utilize MySQL to provide persistence for messaging combined with ActiveMQ's (embedded in Servicemix) high performance journal.	http://www.mysql.com/
Apache Ant	1.6.5	Yes	Apache Ant is a Java-based build tool	http://ant.apache.org/
caGrid Node	1.1	No	caXchange Inbound service is to be installed on caGrid node. This a secure tomcat container configured using the caGrid installer.	http://www.cagrid.org/wiki/CaGrid:How-7



riangle Note: Some of the above software components may not be required depending $ilde{f B}$

Related documents

For additional project information, please refer to the following documents:

- caXchange Software Requirements Specification (SRS)
- caXchange Use Case Specification and Realization Document
- caXchange Design Document
- caXchange Adminstration Guide

The latest versions of these documents can be found in: [1]

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Installing caXchange

Download caXchange distribution

Remove download and reference location in CCTS package

Reference full paths from CCTS main install guide

Perform the following steps to download the caXchange software from GForge:

1. Create a folder Xchg on the local caXchange server under the \$HOME directory, and change to this directory

```
%> cd $HOME
%> mkdir Xchg
%> cd Xchq
```

2. Download caXchange Software from http://gforge.nci.nih.gov/frs/?group_id=411 by performing the following command in the xchg directory:

wget https://gforge.nci.nih.gov/frs/download.php/4581/caxchange-1.1-distrib

3. Extract contents of the caxchange_1_1_xx.tar using

```
Unix: unzip caxchange-1.1-distribution.zip Windows: Winzip utility
```

The files are extracted into a caxchange_1_1_xx directory under the Xchg folder. For ease in changing directories; you can set a CAXCHANGE_DIR variable in the .bash_profile file if desired. Perform the following:

Unix:

```
%> cd $HOME
%> vi .bash_profile
Add the following lines to .bash_profile
%> export CAXCHANGE_DIR=/local/home/tomcat-cax/Xchg/caxchange_1_1_xx
Once complete, perform the following for the updated profile to be loaded:
%> source .bash_profile
```

You can probably remove windows sections, or, at least, put in a disclaimer

Windows:

Installing caXchange 4

Go to My Computer -> View System Information -> Advanced Tab -> Environment Add a new environment variable CAXCHANGE_DIR and give the value as the path

For reference, the following table contains the release contents:

Contents	Description
conf/tomcat	Contains templates of config files needed for setting up tomcat.
conf/servicemix	Contains templates of config files needed for setting up servicemix.
conf/grid	Contains tempaltes of config files needed for setting up grid service
conf/activemq	Contains templates of config files needed for setting up activemq cluster
databaseScripts	Contains database scripts
gridservice	Contains the grid proxy of the caxchange esb
serviceAssemblies	Contains the service engine and service assembly to be deployed
lib	Contains jars for caXchange
war	Contains war for auditing and logging module
verifyRouting	Contains the jars to verify the routing errors if any
install.properties	Contains the property files to be used to run the ant scripts for caxchange installation
build.xml	Build files for installing servicemix, deploying caxchange and creating schema
readme.txt	Basic instuctions necessary for caxchange deployment

caXchange build script

caXchange build scripts are developed using ant. Following table contains the available ant targets:

Target	Description
Default Target	Displays the versions of JDK, tomcat, ant and caGrid. It also valdates if JAVA_HOME and CATALINA_HOME are set.
assert	Enforces user to use JDK 1.5 and validates if the CATALINA_HOME is set.
auditor-configure	Configures caXchange auditor to make it ready for its deployment
clean	Deletes the temp folder and its contents
complete-install	Install Servicemix and required components, deploy caxchange components, creates database schema with necessary database tables and other configuration
create-databases	Creates required database schema
db-init	

	Gets the inputs like database name, driver-name, port, host name, user name and password form user and creates databases for caxchange, llt and activemq. Also initializes the environment for the databases
grid-setup	Sets grid service environment for the caxchange
llt-configure	Sets up necessary configuration for the log locator tool used by caxchange to process logged message
llt-deploy	Deploys the llt.war in distribution to CATALINA_HOME set by user and depends on llt-configure
mysql-db-initialize-caxchange	Runs the scripts to create table inside caxchange database name given by user.
mysql-db-initialize-llt	Runs the scripts to create table inside llt database name given by user
sa-deploy	Deploys the caxchange service engine and assembly to servicemix installed in location given by user in install property file
servicemix-components-install	installs servicemix components required by caxchange
servicemix-configure	Updates the servicemix.xml, jndi.xml, activemq.xml, servicemix.properties, grid-caxchange.properties and caxchange.properties for the caxchange deployment
servicemix-configure-smoke-test	Updates the servicemix.xml, jndi.xml, activemq.xml, servicemix.properties, grid-caxchange.properties and caxchange.properties file and caXchangeConf folder for the caxchange deployment and smoke test
servicemix-install	Takes from the user the location where Servicemix has to be installed and url from where Servicemix has to be downloaded. Downloads and installs servicemix in the location specified
smoke-test	Performs the caxchange smoke test to test the validity of the installation of caxchange.
system-init	Creates the temp and the log folders used for temporary processing area logging activities respectively.
tomcat-start	Starts tomcat server at CATALINA_HOME
tomcat-stop	Stops tomat server at CATALINA_HOME
verify-routing	Validates the correctness of the routing deployed in caXchange.
version-check	Checks the software versions used in the user's machine.

caXchange installation configuration using install.properties

It was not clear on first reading that this is informational and the installation instructions come later. Please make this clear

caXchange installation can be configured using install.properties file. This file is located in the CAXCHANGE_DIR where the caXchange deployment bundle is unzipped. Please note that install.properties file is used only at the time of installation by the build process. caXchange uses caxchange.properties file described in the next section for the runtime properties. Following table describes properties in install.properties. These properties should be modified per the deployment environment.

Property	Description
SERVICEMIX_HOME	Location where Servicemix will be installed
	Default:C:/Servicemix_Grid_Installation
SMX_URL	URL from where servicemix will be downloaded
	Default: http://people.apache.org/repo/m2-ibiblio-rsync-repository/org/apache/service
caxchangedb.driverClass	MySql driver name for caxchange, llt and activemq databases
	Default:org.gjt.mm.mysql.Driver
caxchangedb_host	MySql database host for the caxchange database
	Default:localhost
caxchangedb_port	MySql port for the caxchange database
-	Default:3306
caxchangedb1_name	MySql database name for the caxchange database to be created
	Default:cax
caxchangedb_username	MySql username for the caxchange database
ounonangous_use_	
caxchangedb_password	Default:root MySql password for the caxchange database
caxchangedo_password	
	Default:caxchange
llt_db_host	MySql database host for the llt database
	Default:localhost
llt_db_port	MySql port for the llt database
	Default:3306
llt_db_name	MySql database name for the llt database to be created
	Default:1lt
llt_db_username	MySql username for the llt database
	Default:root
llt_db_password	MySql password for the llt database
	Default:caxchange
amq_host	Name of the machine where ActibeMQ message broker is installed
_	Default:localhost
amq_port	Port number for the ActiveMQ message broker

	Default:61616
amq_db_host	MySql database host for ActiveMQ the database
	Default:localhost
amq_db_port	MySql port for the ActiveMQ database
and_do_port	lytysqi port for the ActivelyiQ database
	Default:3306
amq_database_name	MySql database name for the ActiveMQ database to be created
	Default:amq
amq_db_username	MySql username for the ActiveMQ database
,— _	
	Default:root
amq_db_password	MySql password for the ActiveMQ database
	Default:caxchange
delegation_certificateFilePath	Delegation certificate for GAARDS
	Default: Cyloarthay/local cart nam
delegation_keyFilePath	Default:C:/certkey/local-cert.pem Delegation key for GAARDS
delegation_keyrneratii	Delegation key for GAARDS
	Default:C:/certkey/local-key.pem
ccts_grid_test_userName	CCTS test login username
	Default:cctsdemo1@nci.nih.gov
ccts_grid_test_password	CCTS test login username
	Default:!Ccts1
dorian_service_url	URL for the dorian service
delegation_service_url	URL for the credential delegation service
authentication_service_url	URL for the authentication service
caxchange_host_identity	Host identifier where caxhange is deployed
ctom_registration_url	URL for the CTOM register consumer service. Message type REGISTER_SUBJECT
ctom_registrationRollback_url	URL for the CTOM rollback register consumer service. Message type REGISTER_S service.
ctom_study_url	URL for the CTOM study consumer service.Message type STUDY_CREATION are
ctom_studyRollback_url	URL for the rollback of the CTOM study consumer service. Message type STUDY_C this service.
ctom_labLoader_url	URL for the CTOM lab loader service. Message type CT_LAB_DATA are routed to
psc_registration_url	URL for the PSC register consumer service.Message type REGISTER_SUBJECT are
psc_registrationRollback_url	URL for the PSC register consumer service.Message type REGISTER_SUBJECT an
psc_study_url	URL for the PSC study consumer service. Message type STUDY_CREATION are ro
psc_studyRollback_url	URL for the PSC study consumer service.Message type STUDY_CREATION and o

psc_adverseEvent_url	URL for the PSC schedule modification service. Message type SCHEDULE_MODIF
caaers_registration_url	URL for the caAERS register consumer service. Message type REGISTER_SUBJEC
caaers_registrationRollback_url	URL for the caAERS register consumer service. Message type REGISTER_SUBJEC
caaers_study_url	URL for the caAERS study consumer service. Message type STUDY_CREATION ar
caaers_studyRollback_url	URL for the caAERS study consumer service. Message type STUDY_CREATION ar
caaers_labLoader_url	URL for the caAERS lab viewer consumer service. Message type LAB_BASED_AE
c3d_registration_url	URL for the C3D register consumer service. Message type REGISTER_SUBJECT ar
loadLab_url	URL for the cdms load lab service. Message type LOAD_LAB_TO_CDMS are route

Mote:Please make sure that these properties are set based on your deployment

Host credential certificate/key

This section doesn't seem to make sense - what are "these"?. Rewrite and make sure they understand it is information ala last comment

These are the certificate/key for the host where caXchange is deployed. These are generated using the caGrid GAARDS user interface. caXchange uses these to get the Grid proxy from Credential Delegation Service. These are generated as part of the CCTS installation. caxchange.properties entries delegation_certificateFilePath, and delegation_keyFilePath should be updated to point to the certificate and key respectively.

Installation Steps

Pre-requisites

Pre-requisites set during CCTS main install - I think you can remove this

• Ensure that pre-requisite softwares - Java, Ant, Servicemix, MySQL, Globus and Tomcat as identified in pre-requisite section are pre-installed. Please make sure that the following environment variables are set based on pre-requisite installation in your environment:

- ♦ CATALINA HOME=/where/tomcat/is/installed
- ♦ GLOBUS_LOCATION=/where/globus/is/installed
- ♦ ANT_HOME=/where/ant/is/installed
- ♦ JAVA HOME=/where/java/is/installed

You should make this an explicit step because ServiceMix will NOT be installed up to this point

• This install script also provides a target to install Servicemix in case it is not pre-installed. To use this target to install Servicemix browse to the CAXCHANGE_DIR directory where the caXchange deployment bundle is unzipped and execute:

ant servicemix-install

The database tables, etc. are not already created, so make this an explicit step

• Database schemas as defined in install.properties are required to be pre-created. If they are not pre-created they can be created by executing following command. This command should be executed from the CAXCHANGE_DIR directory where the caXchange deployment bundle is unzipped.

```
ant create-databases
ant mysql-db-initialize-caxchange
ant mysql-db-initialize-llt
```



Note: Please note that if we execute create-databases target any pre-exist

- create-databases: Creates the database schemas.
- mysql-db-initialize-caxchange : Creates the mysql database tables required for caXchange.
- mysql-db-initialize-llt: Creates the mysql database tables required for Log Locator Tool.
- For MySQL database a user id with an ability to create, update and insert on tables is required. These values are set in the install.properties.

Installing caXchange Hub

Use full paths based on CCTS install guide

Use example database properties based on CCTS install

Pre-requisites 10

- Go to CAXCHANGE_DIR as defined in section "Download caXchange distribution".
- Edit install.properties and provide the values to various properties to suit the environment. Verify the database properties, activemq connection properties and grid urls and host identities are per deployment environment. These properties are used during installation. Once the installation is done caXchange uses the caxchange.properties file for its runtime information. This file is located in the conf folder where servicemix is installed.
- Install the caXchange software. Execute

ant hub-install

• Results of the installation are spooled as well logged in an installation file created in a CAXCHNGE_DIR\logs\install-yyyy-mm-dd-HH-MM.log file.

Installing caXchange Inbound Grid Service

Use full paths based on CCTS install guide

Use example ports/URLs from CCTS install

- Go to CAXCHANGE_DIR as defined in section "Download caXchange distribution".
- Environment variable CATALINA_HOME should be set to the location of the tomcat instance where we want to install the caXchange Inbound Grid Service.
- Execute

ant grid-setup

- Results of the installation are spooled as well logged in an installation file created in a CAXCHNGE_DIR\logs\install-yyyy-mm-dd-HH-MM.log file.
- Start tomcat.
- To verify the installation of the grid service, start tomcat server. Start a new session of internet explore and test following URL if axis service is running.

https://<<MACHINE_NAME>>:<<PORT_NAME>>/wsrf-caxchange/services/cagrid/CaXchange
Please replace <<MACHINE NAME>> and <<PORT NAME>> with the details of tomca

Deploy and Configure Log Locator Tool (LLT) and Auditor

Use full paths based on CCTS install guide

Use example ports/URLs from CCTS install

• Execute

ant llt-deploy
ant auditor-configure

- Go to CAXCHNGE_DIR\conf\tomcat. This folder contains following files
 - ♦ llt-login.config
 - ♦ llt-catalina.properties
 - ♦ llt-server.xml
- llt-login.config contains data source information for caXchange. This information needs to be provided to tomcat. If CATALINA_HOME\conf\login.config exists please copy the information from llt-login.config. If CATALINE_HOME\login.config does not exist then please create login.config with this information.
- Ilt-catalina.properties contains the security related information. Please copy the line in Ilt-catalina.properties to CATALINA_HOME\conf\catalina.properties. If catalina.properties is already configured sp that java.security.auth.login.config is pointing to a file other than login.config, then please copy the information from Ilt-login.config into that file.
- llt-server.xml contains the llt context information. This has to be copied in between the host tag of CATALINA_HOME\conf\server.xml
- Restart tomcat.
- Verify that llt install is working by browsing to the following url:

https://<<MACHINE NAME>>:<<PORT NAME>>/llt

Please replace <<MACHINE_NAME>> and <<PORT_NAME>> with the details of tomca

*username: cctsbunduser
*password: changeme
*application: caxchange

Configure Routing

This configuration needs to be included here, using values from the CCTS install

Routing components can be modified within caXchange to route to new target Grid services, and alter the routing of existing Grid services. This is done by modifying the external configuration files for the beans service unit and the EIP routing service unit under the servicemix_home/conf folder. Please refer to the caXchange Administrators Guide for additional details.

Verify Installation - Smoke Test

<font color="red".Use full paths

User URL for Dorian, CDS, etc. from CCT install guide

- Smoke Test has to be run only from the machine where caXchange inbound grid service has been deployed
- Before running the smoke test please make sure that junit.jar ver 3.8.1+ is copied to the ant\lib folder.
- Stop Servicemix.
- Go to CAXCHANGE_DIR as define in section 2.2
- Edit install.properties and provide property values for following properties as per the environment

Property	Description
ccts_grid_test_userName	CCTS test login username
	Default:cctsdemo1@nci.nih.gov
ccts_grid_test_password	CCTS test login username
	Default:!Ccts1
dorian_service_url	URL for the dorian service
delegation_service_url	URL for the credential delegation service
authentication_service_url	URL for the authentication service
caxchange_host_identity	Host identifier where caxhange is deployed

• Execute following command

ant configure-smoke-test

- Start Servicemix.
- Go to CAXCHANGE_DIR/gridservice/caXchangeInboundService
- Execute following command

ant clean all
ant -lib \$GLOBUS_LOCATION/lib test -Dcaxchange.url=https://{TomcatServerNa

- Audit trail and the status of the smoke test are spooled on the console as well as logged in the CAXCHANGE_DIR\gridservice\caXchangeInboundService\test\logs\junit.log file.Status of the smoke test would also be there in CAXCHNGE_DIR\logs\install-yyyy-mm-dd-HH-MM.log file.
- Stop Servicemix
- Execute following command

ant revert-smoke-test

• Start Servicemix

caXchange runtime configuration using caXchange.properties

Provide example URLs based on CCTS install guide

Once the installation is completed by the build process please edit caXchange.properties file to provide the url for each of the partner application integrating with caXchange e.g. CTODS, PSC, caAERS, C3D etc. These urls can be provided as part of the installation procedure using install.properties. There are other properties which also can be modified if required these are database urls, user ids, passwords, JMS provider URL, host certificate, host key etc. caXchange.properties is described in more details in the caXchange Administration Guide.